RAND

Paying for Assistants at Surgery under Medicare

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PREFACE

This report was developed as part of a Health Care Financing Administration (HCFA) project to study the use of assistants-at-surgery. It is intended to help health care policymakers evaluate the cost containment effects of existing policies on the use of assistants-at-surgery and develop changes in policy for paying for assistants. This research was performed under HCFA Cooperative Research Agreement C-98489/9-08 by the RAND/UCLA/Harvard Center for Health Care Financing Policy Research.

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SUMMARY

In a long-standing effort to constrain the rising costs of physicians services under Medicare, policy makers continue to look for new strategies for payment to assistants-at-surgery. Currently, Medicare provides a separate payment to physicians billing as an assistant-at-surgery equal to 16 percent of the primary surgeon's payment. A physician's assistant receives 65 percent of the payment a physician would receive. Certain procedures are excluded from payment, and cataract surgery requires prior approval for payment to the assistant. Medicare requires teaching hospitals to use residents as assistants-at-surgery when available and residents may not bill for physician services provided to Medicare beneficiaries.

This report examines Medicare's policies for payment of assistants-at-surgery. It presents a conceptual framework for considering the impact of these policies and describes patterns of physicians' billing as assistants-at-surgery. Finally, it presents a plan for studying the feasibility of incorporating payments to assistants for inpatient surgery within Medicare's payment to the hospital.

The analyses combined Medicare claims for surgical hospital stays and physician surgical services delivered in each of the years 1986 and 1989. The claims consist of all claims for a 5 percent sample of beneficiaries. To obtain a better understanding of individual physician's billing as an assistant-at-surgery, we also analyzed surgical admissions for a 5 percent sample of physicians. To make the data processing manageable and because of limitations of the data, we restricted our analysis of the physician-based sample to solo practitioners in six specialties: general practice, family practice, internal medicine, general surgery, orthopedic surgery, and thoracic surgery.

Medicare's policy of requiring prior approval for assistants at cataract surgery greatly reduced the amount Medicare pays for assistants. However, the current policy of excluding assistants for procedures in which assistants are used nationally less than 5 percent

of the time would have saved only $4.59 million in 1989. Therefore, the list of excluded procedures does not represent a large savings.

Prior analyses of assistants-at-surgery found wide variation in physicians' billing as assistants-at-surgery by geographic region and specialty. We show that such variation persisted in 1989 as well as 1986. Regression analyses are used to show that the geographical variation cannot be explained by available characteristics of the patient.

A theoretically attractive way to pay for assistants-at-surgery is to bundle the payment with the DRG payment to the hospital. Under this alternative, an increment is added to the hospital's DRG payment which covers the expected payment for the assistant-at-surgery. This increment allows the hospital, as with other inputs, to choose the most cost-effective personnel. The hospital receives the same increment in payment regardless of whether an assistant is used and of the choice of personnel. The primary surgeon, unaffected by this financial mechanism, will continue to ensure standards of care comparable to existing care.

The hospital could adopt its own financial arrangements for paying the assistant. For example, a hospital may choose to have a nurse first assistant on salary who can serve as assistant in some cases, yet serve in other pre-operative and operative functions when not called upon to serve as an assistant. For cases in which the primary surgeon determines that another surgeon is required, the assistant-at-surgery might bill the hospital instead of Medicare. If the hospital found that a particular surgeon had another surgeon serve as an assistant more often than other colleagues, the hospital could inform the surgeon and negotiate a compromise.

The first step for assessing the merit of this alternative payment strategy is to determine this strategy's financial impact on hospitals. This can be modeled prior to implementation.

One potential problem facing this payment strategy is an insufficient choice of personnel in certain areas. For example, in rural areas, family and general practitioners may serve as assistants more often because other types of personnel, both surgeons and physician assistants, may not be available. In these instances, hospitals may be

unable to negotiate a payment level and may have to accept whatever the physician charges. Unfortunately, information on the supply of non-physicians is very limited.

Monitoring the effects of this payment methodology, if implemented, should attempt to evaluate reductions in the quality of care, increases in the burden or costs of administration, and the financial impact on hospitals, physicians, physician assistants, and nurse first assistants. Finally, shifts of surgeries to other settings should also be monitored. Since this system only applies to inpatient surgeries, it might lead to more surgeries being provided in outpatient settings. For example, a surgeon may prefer to have another surgeon serve as assistant in an outpatient setting rather than use hospital staff in an inpatient setting. This may not reflect inappropriate care per se, so any ill effects from a shift would have to be determined.

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1. INTRODUCTION

In 1989, the Medicare program spent $350 million in payment to physicians billing as assistants-at-surgery. This increased to $360 million in 1990. Then, with the new restrictions imposed by the Omnibus Reconciliation Act of 1990 (OBRA90), Medicare payment for assistants-at-surgery fell to about $290 million in 1991. Implementation of the new physician payment system further reduced payments for assistants to about $250 million.[1]

In a longstanding effort to constrain the rising costs for physicians services under Medicare, policymakers have looked for new strategies for payment to assistants-at-surgery. An assistant-at-surgery actively assists the primary surgeon, and may be a physician, a resident in a teaching hospital, a physician's assistant (PA), and in some states, a nurse first assistant. Nonphysician assistants may either be hospital staff or employed by a physician. A wide variation in the choice of potential personnel, financial arrangements, and practice style as well as limitations of data have made it difficult to establish specific standards or a single payment methodology. As a result, an incremental approach to restrictions in Medicare payment for assistants-at-surgery has produced a patchwork of payment policy which frustrates policymakers, physicians, and nonphysician providers.

AIMS OF POLICY

An ideal payment strategy would promote cost-effective use of assistants-at-surgery, maintaining quality of care while assuring equity of payment and avoiding excessive administrative burden. Such a strategy would encourage the use of an assistant-at-surgery only when appropriate and provide incentives for efficient substitution of labor. That is, while some surgeries might require a physician to serve as the assistant, in other instances, a physician's assistant might provide effective assistance at less cost. An ideal payment strategy would also

[1]Based on 1989, 1990, 1991 and 1992 Part B Medicare Data procedure files (BMAD-1).

prevent inappropriate billing without imposing an excessive administrative burden on the providers of care.

CURRENT PAYMENT POLICIES

Currently, Medicare provides a separate payment to physicians billing as an assistant-at-surgery which equals 16 percent of the primary surgeon's payment. A physician's assistant receives 65 percent of the payment a physician would receive. Certain procedures are excluded from payment, and cataract surgery requires prior approval for payment to the assistant.

Before 1986, only residents in teaching hospitals were excluded from payment. Medicare pays teaching hospitals a direct medical education payment per resident to cover its share of training residents. Hence, since the resident receives a stipend to which Medicare contributes through Part A, Medicare denies Part B payments to residents for services provided to Medicare beneficiaries. In addition, Medicare requires teaching hospitals to use residents as assistants-at-surgery when available.

Beginning in April 1986, Medicare required prior approval for assistants-at-cataract surgery. At the time, improved techniques made the necessity of an assistant questionable, and high payments coupled with a large volume of these surgeries led to large expenditures on assistants for this procedure.

Under OBRA90, the payment for assistants-at-surgery was reduced from 20 percent of the primary surgeon's payment to 16 percent. In addition, procedures in which assistants were used less than 5 percent of the time nationally were excluded from payment.

Finally, with the implementation of the Medicare Fee Schedule in January 1992, resource-based payments led to reductions in payment for surgeries. Since assistants are paid a percentage of the primary surgeon's payment, physician payment reform further reduced payments to assistants-at-surgery.

While these incremental changes in Medicare payments for assistants-at-surgery have resulted in substantial cost savings, underlying regional variation in physicians' billing as assistants-at-

surgery lead many policymakers to suspect that inequity in payment, ineffective inducements for efficient substitution of labor, and lack of controls to discourage inappropriate billing remain imbedded within the payment system.

OUTLINE OF REPORT

This report examines Medicare's policies for payment of assistants-at-surgery. It presents a conceptual framework for considering the impact of these policies and describes patterns of physicians' billing as assistants-at-surgery. Finally, it presents a plan for studying the feasibility of incorporating payments to assistants-at-inpatient-surgery within Medicare's payment to the hospital.

Section 2 describes the data sources and the construction of the analysis files derived from these data. Section 3 discusses the impact of elements of the current Medicare payment policy for assistants-at-surgery, while Section 4 explores potential weaknesses in the current payment policy by describing patterns of billing by physicians as assistants-at-surgery. Specifically, this section explores the geographic variation in physicians' billing, and describes individual physicians' patterns of billing as assistants. Section 5 presents a method for incorporating payments for assistants-at-inpatient surgery within Medicare's hospital payment and for a plan for studying the merit of this option. Section 6 concludes this report with a summary of the findings and the conclusions drawn from them.

2. DATA AND METHODOLOGY

DATA SOURCES

The analyses combined Medicare claims for physicians' services and inpatient hospital stays. The claims for physicians' services come from the Part B Medicare Data (BMAD) files which provide all claims for a 5 percent sample of beneficiaries. BMAD also contains another file consisting of all claims for a 5 percent sample of physicians. Each claim for physician services, whether from the sample of beneficiaries or physicians, provides similar information such as the type of service provided, how much Medicare paid for the service, identifiers for the beneficiary and the physician's practice, and the specialty of the physician. Each claim also includes a Current Procedural Terminology (CPT) code and modifiers that identify the specific procedure or service provided.

Claims for inpatient hospital stays supplemented claims for physician services by providing diagnostic codes and a diagnosis-related group (DRG) for each stay. This allowed identification of comorbidities and other measures of the nature of the beneficiary's illness.

Two analytic files were constructed from these files: one based on the sample of beneficiaries and the other on the sample of physicians. The sample of beneficiaries provides a representative look at the Medicare population and allowed us to examine the use of assistants-at-surgery in general. For the construction of this analytic file, we took advantage of a file, called the Part A-BMAD linked file, that combined the 1989 BMAD beneficiary file with the hospital claims for that 5 percent sample of beneficiaries.

However, to gain a better appreciation of individual physician's practice styles we used claims from the sample of physicians focusing on certain specialties. To link hospital claims to this sample of physicians required using the 100 percent MEDPAR file to identify the hospital record corresponding to each physician claim for a hospital service.

CONSTRUCTION OF PATIENT-LEVEL SURGERY FILE

Since one of the analytic tasks was to use 1989 claims to replicate analyses based on 1986 claims, construction of the patient-level file mirrored that for the 1986 analysis (Trude, 1990). The outpatient claims for 1989 did not contain sufficient information for assigning a DRG, and since inpatient surgeries account for about 87 percent of assistant-at-surgery dollars, analyses were restricted to inpatient surgeries.

A surgery was the unit of analysis and was defined as all procedures performed on a Medicare beneficiary in one day. If any of the procedures coded on the hospital record occurred on different days, these were counted as separate surgeries. For each surgery, we combined the hospital information with claims from the primary surgeon and assistants-at-surgery. The physician with the largest allowed charge was considered the primary surgeon.

We linked physicians' claims for each surgery in two steps. First, we linked all physician claims for inpatient surgery which had an expense date that exactly matched the hospital claim's date of surgery. Because of inconsistencies in date and place of service between the hospital records and the physicians claim, we then loosened these restrictions and linked physicians' claims if the date of service was within 10 days regardless of the place of service.

CONSTRUCTION OF PHYSICIAN-LEVEL FILE

As mentioned earlier, the sample of physicians collects all Medicare claims submitted by a 5 percent sample of physicians. We used this file, as is, for some analyses across all specialties and practice arrangements. However, to obtain a better understanding of individual physician's billing as assistant-at-surgery, we constructed an analysis file containing all of the surgical admissions for each physician. To make the data processing manageable and because of limitations of the data, we restricted our analysis to solo practitioners in six specialties: general practice, family practice, internal medicine, general surgery, orthopedic surgery, and thoracic surgery.

For the analysis of physicians, we wanted to determine how often an individual physician bills as an assistant-at-surgery for each of their hospitalized surgical patients. Therefore, we first had to determine all of the surgical admissions for which the physician might have served as an assistant-at-surgery, and then within this set, determine those for which the physician did bill as an assistant.

The first step of file construction began with extracting all unique beneficiary and physician pairs for the six specialties from the 1986 BMAD provider file. We then extracted all of the hospital claims from the 100-percent MEDPAR file for each of those beneficiaries. Finally, we linked each hospital claim back to the beneficiary and physician pair derived from the sample of physicians. Since a beneficiary may have more than one physician and multiple hospitalizations over a year, we replicated each hospital claim for each beneficiary and physician pair. Finally, we selected only hospitalizations with surgical DRGs.

In a separate process, we extracted all physicians' claims for assistants-at-surgery from the 1986 BMAD provider file. Claims for assistants-at-surgery were identified by the code for the type of service and by modifier codes for the surgical procedure. Anesthesiologists, who sometimes bill as assistants-at-surgery, were excluded. We then aggregated these claims to one record for each physician and beneficiary pair so that multiple billings were consolidated onto a single record. However, within each record, we retained the date and allowed charge for each instance of billing as an assistant-at-surgery. Then we linked this information about billings as assistants-at-surgery to the file of all surgical admissions, and determined which assistant-at-surgery billing, if any, occurred during the hospital stay.[2]

[2]For more information about this file, see Trude, Carter and Douglass, 1993.

3. THE IMPACT OF CURRENT PAYMENT POLICY ON COST CONTAINMENT

The increasing costs of physicians' billing as assistants-at-surgery make it an obvious target for cost containment efforts. In 1990, Medicare paid about $360 million for assistants-at-surgery, although restrictions on payment for residents in hospitals and on billing as an assistant-at-cataract surgery were already in place. With OBRA90, additional cost containment policies were added: reducing payment from 20 percent to 16 percent of the surgeon's fee and denying payment for surgeries that have physicians billing as an assistant-at-surgery at a national rate of less than 5 percent. Under these added restrictions, Medicare spent about $290 million for assistants-at-surgery in 1991. Other changes in payment policy that indirectly affect how much Medicare pays for assistants-at-surgery include the Medicare Fee Schedule's new payment amounts for surgeons and allowing physician assistants to bill Medicare as assistants-at-surgery at 65 percent of the payment a physician would receive. These changes resulted in a reduction in payment for assistants-at-surgery to about $250 million in 1992.

Two aspects of payment for assistants-at-surgery frustrate both cost containment and development of equitable payments. First, actual practice patterns are obscured by the payment system. Since residents in teaching hospitals may serve as assistants-at-surgery but do not bill, one cannot discern the true rates at which various surgeries actually have an assistant-at-surgery present. In addition, one cannot determine when other hospital staff may serve as an assistant because they do not bill. In general, this means that one cannot use claims to readily determine the current practice standards for the use of an assistant-at-surgery.

Substantial geographic variation in physicians' billing as assistants-at-surgery further stymies developing an appropriate level of payment. Even after controlling for the billing differences for surgeries in teaching hospitals, some geographic areas have much higher rates of billing than others. This even occurs for surgeries identified

by the American College of Surgeons as needing an assistant-at-surgery at least 95 percent of the time (PPRC, 1991). Such geographic variation probably does not reflect differing rates of use of an assistant-at-surgery, but rather different choices about who serves as an assistant and whether Medicare is billed for these services.

Because of the difficulties in uncovering true rates of billing, incremental policy adjustments are made to how Medicare pays physicians who bill as assistants-at-surgery. This section examines three cost containment policies and their impact on Medicare payment for assistants-at-surgery. It begins with a look at the variation in rates for teaching hospitals, and then examines billing for assistants-at-cataract surgery. It concludes with the policy of excluding some procedures from payment.

PAYMENT FOR RESIDENTS IN TEACHING HOSPITALS

Medicare provides two types of payments to teaching hospitals: a direct medical education payment per resident and an indirect medical education payment per case to cover additional costs associated with treatment in teaching hospitals.

Since Medicare pays the hospital a direct medical education payment per resident, it avoids duplicate payment by not allowing residents to bill Part B for services they provide. Medicare also expects each teaching hospital to rely on residents as assistants-at-surgery, and denies payment to the assistant unless an appropriately trained resident is unavailable.

Since residents do not bill Part B for their services, it appears as though teaching hospitals rarely use assistants-at-surgery. Table 3.1 shows that in 1986 physicians in major teaching hospitals billed Medicare as an assistant-at-surgery for 2 percent of all of Medicare beneficiaries' surgeries. This compares to 9 percent for minor teaching hospitals and 14 percent for nonteaching hospitals.

Table 3.1

Billing for Assistants-at-Surgery by Teaching Status of Hospital

Type of Hospitals	1986 % of all instances of Asst.	1986 % of all dollars for Asst.	1986 Proportion of surgeries with Asst. billing	1989 % of all instances of Asst.	1989 % of all dollars for Asst.	1989 Proportion of surgeries with Asst. billing
Nonteaching	73%	67%	.14	56%	52%	.19
Minor teaching	25%	31%	.09	34%	36%	.12
Major teaching	2%	2%	.02	10%	12%	.04
All	100%	100%	.12	100%	100%	.15

Source: Part A-BMAD beneficiary file, 1986 and 1989.

To determine the true rate that physicians serve as an assistant rather than just how often they bill, one can neither rely on the overall rate of 12 percent or the rate for nonteaching hospitals of 14 percent. Since residents do not bill, the rate of 12 percent is too low. On the other hand, nonteaching hospitals provide a less intense mix of services than teaching hospitals and hence probably provide fewer surgeries that require an assistant than do teaching hospitals. Therefore, the rate of 14 percent probably also underestimates the true rate.

Table 3.1 shows that while the rate of billing for assistants-at-surgery increased across all categories from 1986 to 1989, nonteaching hospitals show the largest percentage increase. However, they also show a decrease from 67 percent to 52 percent of total Medicare assistant-at-surgery dollars. Major teaching hospitals, on the other hand, only have billing for 4 percent of surgeries yet capture 12 percent of all assistant-at-surgery dollars. One cannot determine from the data if this represents an increase in intensity of the surgeries provided in teaching hospitals which then necessitated a physician's services rather than those of a resident. However, it does hint at the size of additional payments Medicare would pay if it did not require the use of residents as first choice in teaching hospitals, since one would expect

the rate of use of physicians as assistants in teaching hospitals to be at least that of nonteaching hospitals.

PRIOR APPROVAL FOR ASSISTANTS-AT-CATARACT SURGERY

In 1985, the Office of the Inspector General conducted a review of Medicare payments to assistants-at-cataract surgery. It estimated that HCFA could save between $30 and $40 million per year by eliminating payments for assistants-at-surgery for routine cataract surgery and recommended that the primary surgeon obtain prior approval for the use of an assistant for those surgeries.

Actual implementation of the prior approval legislation began on April 1, 1986, although carriers in nine states already had such restrictions in place. Figure 3.1 compares the rate of physicians billing as assistants-at-cataract surgery in 1986 and 1989. In 1986, an overall decline is accompanied by fairly erratic monthly variation and a suggestion of increased growth at the end of the year. However, by 1989, physicians' billing had smoothed out to a consistent 3 to 4 percent of surgeries. Overall, in 1986, there were about 90 thousand instances of physicians billing as assistants which declined to 64 thousand in 1989. And while Medicare paid $40 million to assistants-at-cataract surgery in 1986, they paid about $22 million in 1989.

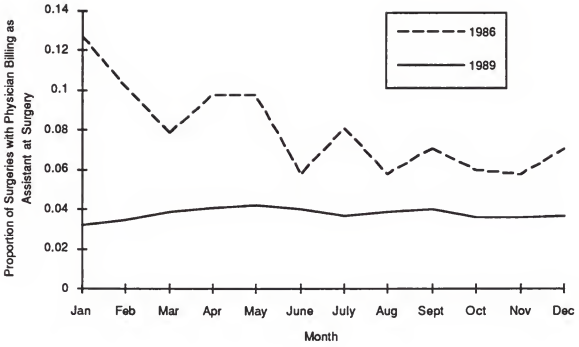

Fig. 3.1—Rate of physicians' billing for assistants-at-cataract-surgery for 1986 and 1989

EXCLUSION OF SPECIFIC PROCEDURES FROM PAYMENT

OBRA90 prohibited payment to assistants-at-surgery for procedures in which assistants are used nationally less than 5 percent of the time. It also legislated a 20 percent reduction in payment, reducing the assistant-at-surgery's payment from 20 percent of the surgeon's payment to 16 percent.

By restricting payment for procedures which rarely require an assistant, the policy aims to exclude payment for those cases less apt to require an assistant. This legislation followed earlier attempts to identify appropriate uses of assistants-at-surgery that ranked procedures by the rate of use of an assistant. After such a ranking, it was hoped that a natural break-off point might be identified where those above the break-off would usually require an assistant, while those

below would not. Unfortunately, such a clear cut delineation was not evident. In addition, such rankings varied across geographic areas.

In its 1991 Annual Report to Congress, the Physician Payment Review Commission (PPRC) warned that the methodology used to identify the excluded procedures did not adequately account for the use of residents in teaching hospitals. By using a national rate which combined teaching and nonteaching hospitals, procedures may have been included which were predominantly performed in teaching hospitals and which usually require an assistant. Combining rates for teaching and nonteaching hospitals substantially underestimated the actual rate and may have led to an inappropriate exclusion of a procedure.

Using the 1989 analytic file for assistants-at-surgery which combines hospital characteristics with claims allows some evaluation of the impact of these exclusions. It also allows investigation of inappropriate exclusions of procedures.

Excluding procedures in which assistants are used nationally less than 5 percent of the time would have saved $4.59 million in 1989. Therefore, the list of excluded procedures represents less than 2 percent of assistant-at-surgery dollars and probably did not contribute much to the large reduction following OBRA90.

Table 3.2 lists ten procedures that are excluded based on the national rate of 5 percent. However, when considering only surgeries performed in nonteaching hospitals, these surgeries have a physician billing at least 5 percent of the time. For example, CPT 19101--an incisional breast biopsy--has physicians billing as an assistant for about 24 percent of surgeries. Based on 1989 claims, excluding these ten procedures would have produced savings of $1.19 million. Clearly, most of the savings from OBRA90 came from a reduction in payment from 20 percent to 16 percent of the surgeon's payment.

Table 3.2

Excluded Procedures that Have Assistants-at-Surgery in more than 5% of Surgeries in Nonteaching Hospitals

	CPT and Description	% of Surgeries with Asst.	1989 Allowed Charges (in $1,000s)
19101	biopsy of breast, incisional	24%	13.1
19120	excision of cyst, breast	18%	129.5
43750	percutaneous placement of gastrostomy tube	13%	83.5
43246	upper gastrointestinal endoscopy	10%	314.4
58120	dilation and curettage, corpus uteri	10%	6.1
31600	tracheostomy	9%	94.9
28810	amputation, toe	9%	37.4
46260	hemorrhoidectomy	6%	55.2
36491	placement of central venous catheter, age > 2	6%	7.6
33207	insertion ventricular pacemaker	5%	371.5

Note: Allowed charges estimated by multiplying data on Part A-BMAD beneficiary file, 1989, by 20.

Source: Part A-BMAD beneficiary file, 1989.

4. PHYSICIANS BILLING AS ASSISTANTS-AT-SURGERY

Earlier, we discussed the limitations of using claims for identifying appropriate or even customary use of assistants-at-surgery. This, unfortunately, frustrates using such data to derive a single policy that promotes appropriate utilization and provides equitable payment. However, much of the payment policy for assistants-at-surgery attempts to eliminate inappropriate billing for assistants, and data analyses may provide insight into the nature and magnitude of any such inappropriate billing.

Prior analyses of assistants-at-surgery found wide variation in physicians' billing as assistants-at-surgery. Physicians in the Mountain and Pacific regions were more than twice as likely to bill as assistants-at-surgery compared to physicians practicing in other parts of the country (Trude, 1990). These analyses controlled for variation in billing due to the teaching status of the hospital. Regional variation persisted even for complex procedures which necessitate the use of a physician as an assistant. The American College of Surgeons identified surgeries for which they would expect a physician to serve as an assistant at least 98 percent of the time.[3] In the state of New Jersey, state statute requires the use of physicians as assistants-at-surgery for such surgeries. Hence, it is surprising that in New Jersey, physicians bill as assistants-at-surgery for only 19 percent of these surgeries in nonteaching hospitals. New Jersey ranks 29th of 50 states and the District of Columbia. The Pacific and Mountain states of Idaho, Colorado, Arizona, Nevada, and California rank as the top six states with the highest rates (PPRC, 1991). In this instance, the geographic variation persists but for surgeries where physicians bill as assistants less often than expected.

[3]These procedures were removal of bladder, anterior vesicourethropexy or urethropexy, ureterotomy, coronary bypass, mitral valve repair, repair atrial or ventricular septal defect, esophagoplasty, colostomy with multiple biopsies for Hirschsprung disease, nephrectomy, excision of intra-abdominal or retroperitoneal tumors, and partial or total colectomy.

This section provides an updated analysis of physicians' billing as assistants-at-surgery using 1989 claims. In addition to comparing the 1986 and 1989 analyses, this section also presents a model based solely on claims for surgeries in nonteaching hospitals. The section concludes with an analysis of individual physicians' patterns of billing as assistants-at-surgery by general and family practitioners.

MODELS OF THE DETERMINANTS OF BILLING AS ASSISTANTS-AT-SURGERY

In previous analyses using 1986 claims, regional variation and the specialty of the primary surgeon provided the most interesting findings (Trude, 1990). In those analyses, the tabulations showed the percentage of assistants-at-surgery dollars accounted for by each region or specialty. For example, general surgeons had a physician billing as an assistant-at-surgery for 13 percent of the instances of assistant-at-surgery billings. On the other hand, surgical specialists had a physician billing as an assistant for 4 percent of all instances (Trude, 1990).

Instead of looking at the proportion of total dollars accounted for by a particular specialty or procedure, it is also helpful to consider the proportion of surgical cases that had an assistant-at-surgery. This allows one to determine how likely it is for a particular procedure to have an assistant-at-surgery or how likely it is for a certain specialty to bill as an assistant. Table 4.1 shows how often a specialty serving as the primary surgeon has a physician billing as an assistant for the surgeries performed by that specialty. The data are restricted to surgeries performed in nonteaching hospitals. For example, in nonteaching hospitals in 1989, thoracic surgeons had a physician bill as an assistant for 44 percent of their surgeries. Gynecologists had a physician as an assistant for almost half of their surgeries. For each of the surgical specialties except for ophthalmology and thoracic surgery, the rates did not differ substantially depending on the urban and rural status of the hospital. In addition, having a physician as an assistant-at-surgery did not vary by urban and rural status for primary practice specialties.

Table 4.1

Proportion of Surgeries for which Physicians Bill as Assistants-at-Surgery in Nonteaching Hospitals by the Primary Surgeon's Specialty and Urban/Rural Status (1989)

Specialty of Primary Surgeon	All	Urban	Rural
General Practice	0.08	0.07	0.10
Family Practice	0.05	0.04	0.06
Internal Medicine	0.01	0.01	0.01
General Surgery	0.32	0.35	0.28
Neurosurgery	0.32	0.33	0.25
Gynecology	0.48	0.47	0.48
Ophthalmology	0.17	0.20	0.06
Orthopedic Surgery	0.34	0.35	0.31
Thoracic Surgery	0.44	0.46	0.32
Urology	0.08	0.09	0.07

Source: Part A-BMAD beneficiary file, 1989.

Table 4.2 shows for each region the proportion of surgeries that have a physician billing as an assistant-at-surgery. Overall, 19 percent of surgeries in nonteaching hospitals have a physician billing as an assistant-at-surgery

Table 4.2

Proportion of Surgeries for which Physicians Bill as Assistants-at-Surgery in Nonteaching Hospitals by Census Region and Urban/Rural Status (1989)

Region	All	Urban	Rural
New England	0.25	0.24	0.31
Mid-Atlantic	0.15	0.14	0.20
South Atlantic	0.16	0.17	0.13
East North Central	0.18	0.16	0.20
East South Central	0.11	0.13	0.09
West North Central	0.16	0.11	0.20
West South Central	0.18	0.19	0.17
Mountain	0.34	0.35	0.31
Pacific	0.31	0.30	0.37
Overall	0.19	0.19	0.19

Source: Part A-BMAD beneficiary file, 1989.

In the Pacific and Mountain regions the rates are 31 percent and 34 percent respectively. These regions show the highest rates of billing while the East South Central regions shows the lowest rate at 11 percent. These rates do not vary much depending on the urban and rural status of the hospital.

Table 4.3 provides the rates of physicians' billings as assistants-at-surgery for both the region and the specialty of the primary surgeon. For example, while general practitioners in the Mid-Atlantic region have an assistant billing for 7 percent of their surgeries, general practitioners in the Pacific region have an assistant billing for 16 percent of their surgeries. In fact, the regional variation, with the highest rates in the West, holds for each of the specialties.

Table 4.4 presents the results of a multivariate model that includes the geographic region and the specialty of the primary surgeon while controlling for patient characteristics. The table provides results for the same model for both 1986 and 1989 claims. This ordinary least squares model's dependent variable is a zero-one variable for whether a physician billed as an assistant-at-surgery. Because the model controls for the patient's diagnosis related group (DRG), a least squares model was used instead of a logistic regression. This way, the DRG could be included in the model but without computing coefficients for each DRG.

The patient characteristics include age, sex, and race. We used the natural logarithm of age and used a zero-one variable for disabled beneficiaries under the age of 65 to capture differences between the Medicare aged and disabled populations. To capture the separate effects of aging on these two population groups, we included an interaction term of the logarithm of age multiplied by the zero-one variable for disabled beneficiaries under the age of 65.

To control for patients that have greater case complexity, we used a simple measure that counts the number of diseased body systems described by the ICD-9-CM diagnosis codes on the hospital claim. We excluded some categories, such as infections and parasites, injury and poisoning, and neoplasms, which are not confined to a single body system.

Table 4.3

Proportion of Surgeries for Which Physicians Bill as Assistants-at-Surgery in Nonteaching Hospitals by the Primary Surgeon's Specialty and Census Region (1989)

Specialty of Primary Surgeon	All	New England	Mid-Atlantic	South Atlantic	East North Central	East South Central	West North Central	West South Central	Mountain	Pacific
General Practice	0.08	-	0.07	0.10	0.06	0.02	0.08	0.09	0.10	0.16
Family Practice	0.05	-	-	0.03	0.03	0.03	0.06	0.05	-	0.10
Internal Medicine	0.01	-	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.02
General surgery	0.32	0.45	0.30	0.26	0.30	0.17	0.31	0.29	0.55	0.58
Neurosurgery	0.32	-	0.30	0.20	0.30	-0.13	-	0.32	0.48	0.61
Gynecology	0.48	-	0.36	0.41	0.41	0.32	0.33	0.50	0.75	0.69
Opthalmology	0.17	-	0.26	0.11	0.08	0.08	0.01	0.11	0.17	0.42
Orthopedic surgery	0.34	0.41	0.31	0.29	0.30	0.17	0.24	0.29	0.50	0.58
Thoracic surgery	0.44	0.35	0.26	0.37	0.38	0.30	0.32	0.47	0.67	0.61
Urology	0.08	0.08	0.05	0.08	0.06	0.06	0.05	0.08	0.14	0.17

Source: Part A-BMAD beneficiary file, 1989.

We excluded other categories, such as complications of pregnancy, which do not pertain to the Medicare population. The maximum possible number of involved body systems is nine, but since the hospital claim only provides up to five diagnosis codes, this measure ranges from zero to five. As an example, suppose a patient has three respiratory conditions and one musculoskeletal disorder. This patient would be counted as having two diseased body systems.

In addition to characteristics of the patient, the model includes characteristics of the surgery, such as whether the surgery was a team surgery with more than one primary surgeon in different specialties, and whether the surgery involved more than one procedure. General surgeons are the omitted category for the specialty of the primary surgeon, and the South Atlantic is the omitted region.

Table 4.4 shows similar results for both the 1986 and 1989 models, and demonstrates that the finding of regional variation persists. One notable exception to the similarity of the findings is the reduction in the absolute value of the coefficient for major teaching hospitals from 1986 to 1989. This is consistent with the finding of increased billing for assistants-at-surgery in major teaching hospitals described in an earlier section.

Since physicians' billing as an assistant-at-surgery in teaching hospitals is limited by statute, Table 4.5 presents the results of another ordinary least squares regression restricted to only nonteaching hospitals. In addition, this model controls for hospital size by including the number of beds in the hospital. We find similar results and no effect due to the number of beds.

Table 4.4

Assistants-at-Inpatient-Surgery:
Comparison of Regressions Using 1986 and 1989 Claims

Variable	1986 Claims			1989 Claims		
Patient Characteristics	Coefficient	T-Statistic	Significance Level	Coefficient	T-Statistic	Significance Level
Age less than 65	-0.25	-5.18	0.0001	-0.27	-5.80	0.0001
Logarithm of age	-0.05	-6.00	0.0001	-0.06	-7.30	0.0001
Age interaction	0.06	4.95	0.0001	0.06	5.41	0.0001
Male	0.00	-0.78	0.4382	0.00	0.57	0.5654
Black	-0.01	-2.01	0.0439	-0.01	-5.92	0.0001
More than 1 body system	0.00	-2.44	0.0147	0.00	0.60	0.5484
More than 2 body systems	0.00	-0.13	0.8954	0.00	-1.67	0.0952
More than 3 body systems	0.00	-0.10	0.9210	0.00	1.07	0.2827
More than 4 body systems	0.01	0.89	0.3731	0.00	0.04	0.9671
Hospital Characteristics						
Rural	0.02	7.87	0.0001	0.02	8.95	0.0001
Team	0.02	4.73	0.0001	0.02	5.93	0.0001
Multiple procedures	0.03	14.08	0.0001	0.03	15.41	0.0001
Minor teaching hospital	-0.08	-49.11	0.0001	-0.15	-61.83	0.0001
Major teaching hospital	-0.17	-65.59	0.0001	-0.06	-41.14	0.0001
Specialty of Primary Surgeon						
Group	-0.06	-18.66	0.0001	-0.06	-19.91	0.0001
General practice	-0.09	-33.69	0.0001	-0.10	-36.50	0.0001
Cardiovascular disease	-0.10	-25.09	0.0001	-0.13	-35.23	0.0001
Osteopath	-0.11	-6.81	0.0001	-0.08	-5.22	0.0001
Gastroenterology	-0.12	-32.70	0.0001	-0.11	-33.89	0.0001
Neurosurgery	-0.02	-3.18	0.0015	-0.02	-2.26	0.0237
Gynecology	-0.02	-2.15	0.0316	0.00	0.03	0.9761
Ophthalmology	-0.01	-1.31	0.1917	-0.02	-2.18	0.0291

Table 4.4, cont'd.

Assistants-at-Inpatient-Surgery:
Comparison of Regressions Using 1986 and 1989 Claims

Variable	1986 Claims			1989 Claims		
Specialty of Primary Surgeon	Coefficient	T-Statistic	Significance Level	Coefficient	T-Statistic	Significance Level
Otolaryn	-0.05	-6.25	0.0001	0.06	7.43	0.0001
Other surgical	-0.06	-2.60	0.0093	-0.01	-0.63	0.5274
Orthopedics	-0.01	-2.06	0.0395	0.00	1.00	0.3186
Other medical	-0.14	-28.04	0.0001	-0.12	-28.35	0.0001
Plastic surgery	-0.04	-5.13	0.0001	-0.07	-7.97	0.0001
Proctology	-0.05	-5.16	0.0001	-0.06	-6.26	0.0001
Pulmonary disease	-0.11	-18.31	0.0001	-0.10	-21.12	0.0001
Thoracic surgery	0.05	13.18	0.0001	0.07	20.23	0.0001
Urology	-0.09	-21.92	0.0001	-0.09	-22.18	0.0001
Podiatry	-0.06	-6.76	0.0001	-0.10	-14.15	0.0001
Miscellaneous	-0.15	-8.51	0.0001	-0.10	-4.32	0.0001
Census Region						
New England	0.07	18.99	0.0001	0.04	11.77	0.0001
Mid-Atlantic	0.04	18.65	0.0001	0.02	9.49	0.0001
East North Central	0.01	2.84	0.0045	0.00	1.14	0.2529
East South Central	-0.02	-6.22	0.0001	-0.03	-11.47	0.0001
West North Central	0.03	8.97	0.0001	0.00	1.61	0.1064
West South Central	0.04	15.43	0.0001	0.02	8.73	0.0001
Mountain	0.16	41.65	0.0001	0.13	33.86	0.0001
Pacific	0.19	69.07	0.0001	0.14	55.51	0.0001

NOTE: The dependent variable for these models identified surgeries for which a physician billed as an assistant at surgery. For 1986, the sample size was 193,673 and the R-square was 0.29. For 1989 the sample size was 212,858 and the R-square was 0.29. Each model also included dummy variables for each DRG.

Source: Part A-BMAD beneficiary file, 1986 and 1989.

Table 4.5

Assistants-at-Inpatient-Surgery in Nonteaching Hospitals: Regression Using 1989 Claims

Variable	Coefficient	T-Statistic	Significance Level
Patient Characteristics			
Age less than 65	-0.45	-6.22	0.0001
Logarithm of age	-0.06	-5.91	0.0001
Age interaction	0.10	5.92	0.0001
Male	0.00	-0.38	0.7069
Black	-0.02	-6.13	0.0001
More than 1 body system	0.00	-0.09	0.9286
More than 2 body systems	0.00	-1.92	0.0550
More than 3 body systems	0.00	0.53	0.5960
More than 4 body systems	0.00	-0.31	0.7541
Hospital Characteristics			
Rural	0.00	-0.07	0.9417
Team Surgery	0.01	2.08	0.0380
Multiple procedures	0.03	10.44	0.0001
200 beds or fewer	0.00	0.44	0.6629
201 to 300 beds	0.00	-0.97	0.3335
301 to 400 beds	-0.01	-2.26	0.0240
401 to 500 beds	0.00	-1.07	0.2849
Census Region			
New England	0.10	18.96	0.0001
Mid-Atlantic	0.03	8.82	0.0001
East North Central	0.02	6.42	0.0001
East South Central	-0.04	-10.11	0.0001
West North Central	0.00	0.60	0.5461
West South Central	0.02	6.11	0.0001
Mountain	0.13	26.78	0.0001
Pacific	0.15	45.51	0.0001
Specialty of Primary Surgeon			
Group	-0.08	-17.14	0.0001
General practice	-0.11	-31.10	0.0001
Cardiovascular disease	-0.15	-27.91	0.0001
Osteopath	-0.03	-1.08	0.2779
Gastroenterology	-0.13	-30.58	0.0001
Neurology	-0.11	-8.47	0.0001
Neurosurgery	-0.01	-1.18	0.2370
Gynecology	0.00	0.18	0.8564
Ophthalmology	-0.07	-4.03	0.0001

Table 4.5, cont'd.

Assistants-at-Inpatient-Surgery in Nonteaching Hospitals: Regression Using 1989 Claims

Variable	Coefficient	T-Statistic	Significance Level
Specialty of Primary Surgeon			
Otolaryn	0.09	7.68	0.0001
Other surgical	-0.01	-0.24	0.8125
Orthopedics	0.01	1.33	0.1819
Other medical	-0.17	-25.32	0.0001
Plastic surgery	-0.09	-6.65	0.0001
Proctology	-0.05	-3.07	0.0021
Pulmonary disease	-0.13	-19.16	0.0001
Thoracic surgery	0.06	12.96	0.0001
Urology	-0.10	-18.22	0.0001
Podiatry	-0.13	-12.14	0.0001
Miscellaneous	-0.15	-4.55	0.0001

NOTE: The dependent variable for these models identifies surgeries in nonteaching hospitals for which a physician billed as an assistant at surgery. The sample size was 118,969 and the R-square was 0.35. The model also included dummy variables for each DRG.

Source: Part A-BMAD beneficiary file, 1989.

PHYSICIANS' PRACTICE PATTERNS

Another possibility of potentially inappropriate billing as an assistant-at-surgery would exist if physicians routinely billed as an assistant-at-surgery. We used the 1989 BMAD provider file to determine if there were substantial numbers of physicians who serve primarily as an assistant-at-surgery, but who rarely serve as a primary surgeon. We considered a physician to serve mostly as an assistant if out of all surgeries in their Medicare caseload, at least 90 percent of the surgeries were billed as an assistant. Table 4.6 shows that such specialization occurs at most for 2 percent of the practices in the specialties of general surgery, gynecology, and ophthalmology. About 1 percent of general and family practitioners bill as an assistant-at-surgery for at least 90 percent of their Medicare surgical caseload.

Table 4.6

Percent of Physicians Always Billing or Rarely Billing as an Assistant-at-Surgery by Specialty

Specialty of Primary Physician	Assistant for 1t least 90% of surgeries.	Assistant for less than 10% of surgeries
General Practice	1.2%	79%
Family Practice	0.8%	75%
Internal Medicine	0.1%	97%
General Surgery	1.8%	47%
Gynecology	2.0%	68%
Ophthalmology	2.2%	73%
Orthopedics	0.4%	50%
Thoracic Surgery	0.7%	43%
Podiatry	0.6%	87%

Source: BMAD provider file, 1989.

Earlier analyses found that general and family practitioners accounted for 17 percent of all instances of physicians billing as assistants-at-surgery (Trude, 1990). The majority of family and general practitioners only rarely serve as an assistant, and suspicions of inappropriate billing seem unfounded. In a study of physician practice patterns, this issue was examined more thoroughly using the 1986 physician claims linked to hospital claims for each surgical patient (Trude, Carter and Douglass, 1993). This allowed determination of the rate at which individual physicians billed as assistants at surgery for all of their patients who were hospitalized for a surgery. For completeness, we include some of the findings from that study here.

Table 4.7 shows the types of cases for which general and family practitioners bill as assistants-at-surgery. It contrasts how often they serve as an assistant-at-surgery for a patient hospitalized for surgery to the rate for general surgeons. Of course, general and family practitioners rarely provided assistance during a coronary bypass operation. And for the most part, the DRGs for which general surgeons showed high rates of billing, general and family practitioners showed lower rates. On the other hand, the DRGs for which general and family practitioners showed the highest rates of billing as assistants-at-

surgery showed comparable rates for general surgeons. That suggests a hierarchy of surgeries in which the most complex surgeries require surgeons or surgical subspecialists as assistants. But for surgeries of less complexity, general and family practitioners serve as assistants at about the same rate as general surgeons.

Many factors might contribute to general and family practitioners billing as assistants-at-surgery. Regional variation might result from differences in practice styles. In addition, they might also result from differences in the availability of labor. Urban areas may have increased numbers of both surgical specialists and physician assistants, while rural areas may rely more heavily on primary practitioners. Controlling for casemix, region, and the urban or rural status of the hospital, case-weighted regressions model the proportion of surgeries for which physicians billed as an assistant. Table 4.7 presents a model for each specialty with the coefficients for the DRG weight as the measure of casemix, rural hospitals relative to urban hospitals, and each census region relative to the East North Central region. In these regressions, surgeons show a higher DRG weight associated with a higher rate of billing as an assistant. General surgeons serve as assistants at a lower rate in rural areas, whereas general and family practitioners serve as assistants at a higher rate in rural areas.

Table 4.7

DRGs With Highest Rates of Billing for Assistants-at-Surgery by Specialty

Specialty and DRG	General Practice	Family Practice	General Surgery
General Practice			
159 Hernia procs exc inguinal & femoral	.22	.21	.17
197 Total cholecystectomy w/o CDE	.21	.26	.24
358 Uterus & adenexa proc, nonmalig	.20	.21	.28
354 Nonradical hysterectomy	.20	.23	.27
257 Total mastectomy	.19	.28	.21
356 Female repro reconstruct procs	.17	.15	.14
214 Back and neck procs	.17	.06	.27
161 Inguinal & femoral hernia procs	.17	.24	.15
148 Major small & large bowel procs	.17	.26	.25
146 Rectal resection	.17	.23	.24
195 Total cholecystectomy with CDE	.15	.23	.25
Family Practice			
257 Total mastectomy	.19	.28	.21
164 Appendectomy w compl principal diag	.12	.28	.20
197 Total cholecystectomy w/o CDE	.21	.26	.24
148 Major small & large bowel procs	.17	.26	.25
161 Inguinal & femoral hernia procs	.17	.24	.15
193 Biliary tract proc exc tot cholecy	.08	.24	.25
354 Nonradical hysterectomy	.20	.23	.27
146 Rectal resection	.17	.23	.24
195 Total cholecystectomy with CDE	.15	.23	.25
159 Hernia procs exc inguinal & femoral	.22	.21	.17
358 Uterus & adenexa proc, nonmalig	.20	.21	.28
General Surgery			
334 Major male pelvic procs	.11	.21	.54
106 Coronary bypass w cardiac cath	.02	.00	.47
110 Major reconst vascular proc w/o pump	.10	.12	.36
107 Coronary bypass w/o cardiac cath	.04	.03	.34
5 Extracranial vascular procs	.12	.17	.33
303 Kidney, ureter & major bladder procs	.10	.09	.33
75 Major chest procedures	.13	.10	.32
358 Uterus & adenexa proc, nonmalig	.20	.21	.28
354 Nonradical hysterectomy	.20	.23	.27
209 Major joint & limb reattach procs	.12	.15	.27
214 Back and neck procs	.17	.06	.27

NOTE: Nonteaching only, case-weighted.
CDE = common-duct exploration.
Source: BMAD provider file, 1989.

Table 4.8

Regression of Physicians' Rate of Billing as an Assistant-at-Surgery by Specialty

	Specialty									
Variable	General Practice		Family Practice		General Surgery		Orthopedic Surgery		Thoracic Surgery	
Case mix	-0.03		0.01		0.12	**	0.16	**	0.07	*
Rural	0.04	*	0.08	**	-0.06	**	0.00		-0.09	
New England	0.01		na		0.20		0.05		-0.12	
Mid Atlantic	0.04		-0.08	*	0.06		0.07		0.00	
S Atlantic	-0.07	*	-0.17	**	0.05		0.00		0.08	
E S Central	-0.06	*	-0.16	**	0.07	*	-0.03		0.04	
W N Central	-0.01		-0.05		0.00		-0.04		0.05	
W S Central	0.00		-0.09	**	0.04		0.00		0.18	
Mountain	0.03		0.04		0.03		0.07	*	0.11	
Pacific	0.06	*	0.03		0.08	*	0.07	**	0.07	
R-square for model	0.06		0.18		0.09		0.15		0.30	
Number of physicians	668		513		759		292		102	

NOTE: Non-teaching hospitals only, case-weighted.

na indicates not applicable since there were no family practitioners in the New England region with five or more surgical admissions.

* indicates significance level <0.05.

** indicates significance level <0.01.

Source: BMAD provider file, 1989.

5. INCORPORATING PAYMENT FOR THE ASSISTANT-AT-SURGERY INTO THE HOSPITAL'S PROSPECTIVE PAYMENT

As discussed earlier, an ideal payment policy provides incentives for cost-effective practice. That is, it promotes the least expensive available option which does not compromise quality of care. For example, the adoption of Medicare's prospective payment system which pays hospitals a fixed payment per diagnosis-related group (DRG), aims to encourage hospitals' efficiency. Hospitals are rewarded for providing care that costs less than the prospective payment, but are penalized for exceeding it. Meanwhile, traditional safeguards (e.g., providers' concern for the patient) and Peer Review Organizations (PROs) serve to maintain the standards of high quality of care.

Following the model of the Prospective Payment System (PPS), early attempts at reforming physician payment considered combining payments for physicians' inpatient services into a single prospective payment. These aggregated payments, called physician DRGs, would pay the medical staff or some other entity sufficiently to cover the cost of all physician services required for an inpatient stay. This payment method foundered because nonsurgical cases were too heterogeneous, and no one could identify a satisfactory entity to receive the payment. That is, the financial risk faced by an individual physician was deemed too high, and larger groups of physicians that could administer the payments could not be identified (HHS, 1988).

This section discusses a potential alternative for paying assistants-at-surgery that borrows from the concept of physician DRGs, but applies only to the assistant-at-surgery.[4] Under this alternative, an increment is added to the hospital's DRG payment which covers the payment of the assistant-at-surgery. This increment, based on the average costs of the assistant, allows the hospital, as with other inputs, to choose the most cost-effective personnel. The primary

[4]This discussion details the methodological considerations of this alternative payment strategy while Section 6 addresses research needs that would be required to fully assess its feasibility.

surgeon, unaffected by this financial mechanism, will continue to ensure comparable standards of care.

While the hospital receives a fixed payment per DRG which includes an increment for an assistant-at-surgery, this payment methodology itself does not specify how the hospital should allocate that payment or by what method the assistant-at-surgery should be paid. It allows hospitals to adopt their own financial arrangements for paying the assistant. For example, a hospital may choose to have a nurse first assistant on salary who can serve as assistant in some cases, yet serve in other pre-operative and operative functions when not called upon to serve as an assistant. For cases in which the primary surgeon determines that another surgeon is required, the assistant-at-surgery might bill the hospital instead of Medicare. If the hospital found that a particular surgeon had another surgeon serve as an assistant more often than other colleagues, the hospital could inform the surgeon and negotiate a compromise.[5]

Paying the hospital for assistants-at-surgery through the DRG payment would involve determining an additional increment of payment to include with the DRG payment. This differs from the current policy of paying for each procedure because a procedure may belong to several DRGs. For example, partial colectomy with anastomosis (CPT 44140) represents 7 percent of the assistant-at-surgery dollars for DRGs 146 and 147, and 40 percent of the assistant-at-surgery dollars for DRGs 148 and 149 (Trude, 1990). Although Medicare would provide a different payment increment depending on the DRG even for the same procedure, the hospital might choose to pay the assistant-at-surgery a payment based on the procedure, the length of the operation, or the DRG. Since the primary surgeon chooses which surgery is appropriate for the patient, this decision remains unaffected by the negotiated payment strategy.

Finally, the hospital receives the same increment in payment regardless of the choice of personnel. Currently, Medicare does not

[5]This is similar to profiling, an educational tool recommended by PPRC as a method to guide appropriate use of physicians as assistants-at-surgery (PPRC, 1991). In this case, however, it is unnecessary to compile information from Part B claims because the hospital would maintain the financial information for assistants-at-surgery.

provide a separate Part B payment for a nurse first assistant, but pays a physician assistant 65 percent of what a physician would receive for serving as an assistant-at-surgery. Hospitals would be able to choose to exploit payment differentials in the market and pay nurse first assistants, physician assistants, and physicians differently. Alternatively, the hospital may choose to pay the same payment for the same work regardless of who provides it.

DETERMINING THE DRG PAYMENT

Adding an increment to the hospital's DRG payment involves two steps. First, to maintain budget neutrality, the total Part B expenditures for assistants-at-surgery must be tabulated and added into the total payments for Part A inpatient hospitals. Second, the DRG weights must be recalibrated to reflect the relative proportionate use of an assistant-at-surgery associated with each DRG.

To explain how one might determine the additional increment in payment, several assumptions and options are possible. For purposes of clarity, the description of the methodology will follow one logical thread. However, an important test of the merit of this payment alternative will involve testing the sensitivity of payment amounts to any assumptions or options. That is, a less rigorous computational method should only be considered after determining its effects on payment levels and the financial impact of any differences.

A budget-neutral methodology assumes that current total expenditures should be maintained, although allocation may require changes. Hence, although billings for physicians as assistants-at-surgery show geographic variation, a budget-neutral payment would deem that regardless of this variation, the total dollars are appropriate. Maintaining budget-neutrality has the added allure of simplicity. Indeed, lack of information about the appropriate payment level and choice of personnel to serve as assistants-at-surgery preclude determining the "correct" total spending for assistants.

Hence, the first step of determining the total transfer amount involves simply summing up the total expenditures for assistants-at-surgery from the Part B procedure file which aggregates allowed payments

for all physician services. This would include both payments to physicians and physician assistants. Nurse first assistants employed by physicians, unfortunately, could not be included in this total, but would presumably be a small portion of the total payment.

OBRA90 and the new Medicare Fee Schedule have substantially reduced spending for assistants-at-surgery. An important consideration for determining the total amount of payment to transfer would be deciding from which year's data to calculate total payments for assistants-at-surgery.

The most rigorous approach for determining the appropriate level of payment for the assistant would entail developing resource-based relative values for assistant-at-surgery services. In Phase II of the Hsiao study, relative work values were determined for a handful of procedures. For these cases the amount of work relative to the primary surgeon varied by procedure. For example, assisting for elective below-knee amputation represents 15 percent of the total work of the primary surgeon, while a right colectomy with anastomosis represents 27 percent of the total work of the primary surgeon (PPRC, 1991).

To add further complexities, these evaluations were obtained from physicians whose experience as assistants may represent the most complex cases, that is, those cases that require an assistant or that require another surgeon as an assistant. Physician assistants, who currently receive 65 percent of what a physician receives, may tend to assist for less complicated cases that would involve less total work for both the primary surgeon and the assistant.

Hence developing relative work values would best apply to those procedures that always require the use of a physician as an assistant. Unfortunately, these are not the instances that prove most problematic. The rationale for incorporating payment for assistants into the DRG is to provide incentives for efficiency and appropriate use of physicians and nonphysicians as assistants, and hence this methodology is designed for those instances where empirical research suggests use of an assistant-at-surgery is discretionary.

After determining the amount of funds to transfer from Part B to Part A, the next step involves recalibrating the DRG weights to reflect

the use of assistants-at-surgery within a given DRG. If hospitals had paid for assistants-at-surgery all along, their charges would be included in the professional component and would automatically be part of the DRG weight calculation. In fact, residents and nurse first assistants are currently included within the professional component of the Uniform Bill. Therefore, we only need to link charges for assistants-at-surgery in the Part B claims to the corresponding hospital claim. Adding the increment for the assistant will increase the total charges for a DRG in instances where a physician almost always serves as an assistant. After recalculating the DRG weights, that DRG weight would be larger relative to a DRG that never had an assistant-at-surgery (all other things being equal).

To link a payment for assistants-at-surgery to a DRG, two pieces of information are required: the payment per procedure, and the number of assistant billings for a particular procedure for a given DRG.

As mentioned earlier, developing resource-based relative work values for assistants does not seem practical since a consensus panel would not be able to sort out instances in which a procedure did not require an assistant and for which other personnel might serve. And developing work values based on time and intensity would require determining the appropriate mix of personnel for a particular procedure. So although time and intensity could be measured for a surgeon, a physician assistant, and a nurse first assistant, the appropriate mix of personnel for a procedure would still have to be determined.

The payment to an assistant-at-surgery is determined from the allowed charges in a Part B bill, so the amount of the payment will depend on the year the service was provided. Before 1992, the allowed charges would be based on the customary, prevailing, and reasonable (CPR) methodology. From 1992 and up until 1996 the payment would be based partially on the Medicare Fee Schedule, as this is the period of transition to the full fee schedule. One possibility is to allocate 1996 payment levels to the professional component of the hospital claim.

Payment levels would differ depending on the type of personnel serving as an assistant. For example, as under the current system, the physician assistant might receive a fixed percentage of what a physician

receives. Or, consistent with the fee schedule which pays the same for a procedure regardless of the specialty of the physician, one could assign the same payment to the assistant regardless of whether the assistant was a physician or a physician assistant.

The determination of the transfer of funds from Part B to Part A is only calculated at baseline. So only the DRG weights must be recalibrated periodically to reflect changes in practice and costs of inputs. This is a simple matter as hospitals begin to incorporate charges for all assistants-at-surgery into the professional component. Then, any recalibration will automatically include changes in the use of assistants-at-surgery.

Under the current payment methodology, payment to physicians includes a geographic adjustment so that physicians practicing in a more expensive locality would receive a higher payment for a given service than a physician in a less expensive area. The DRG payment also incorporates a geographical adjustment or wage index based on the wages of hospital staff within a given area. Because of adjustment to the DRG payment from the wage index, the increment in payment to the hospital for assistants-at-surgery should be larger in expensive areas than less expensive areas. However, if the hospital wage adjustment does not accurately reflect geographic differentials in payment for physicians, there may be some areas that receive too high of an increment in payment while others are too low. Measuring the level of agreement between these two geographic adjustors and modelling the impact across geographic areas should highlight the existence of potential problems.

Teaching hospitals add another wrinkle of complexity using DRGs as a payment strategy for assistants-at-surgery. Inclusion of teaching hospitals into this payment system would require adding the residents' share of assistant-at-surgery services into the funds supplied to Part A. Presumably this would be offset by reductions in payments for teaching. Without this adjustment, teaching hospitals would experience a gain in payment per DRG at the expense of nonteaching hospitals. Alternatively, teaching hospitals could be left out of this payment method.

Current proposals for graduate medical education reform stress the need for fewer specialty residencies and increased training of residents in ambulatory care settings. This would eventually lead to increased billings for assistants-at-surgery in teaching hospitals without providing the same incentives faced by other hospitals and physicians. So even though it might seem simpler to leave teaching hospitals out of this payment system initially, they would need to be incorporated into the payment methodology at some point in the future. In anticipation of this, it would prove useful to add a code to the uniform bill that identifies when a resident serves as an assistant-at-surgery. Charges for their services are currently incorporated into the professional component, but are not separately identified. Identifying these instances would improve estimates of residents' share of assistant-at-surgery services.

EVALUATION ISSUES

The first step for assessing the merit of this alternative payment strategy is to determine this strategy's financial impact on hospitals. This can be modeled prior to implementation. First, the new standard payment amount and new DRG weights are calculated. Next, total Medicare revenue for hospitals is calculated to determine which hospitals "gain" or "lose" under this option. While the largest impact will probably be geographic redistribution, it also makes sense to evaluate the impact on certain types of hospitals that might be most sensitive to changes in payment, (e.g., hospitals serving a disproportionate share of the poor). (This is also an ideal time to test the sensitivity of payment levels to various assumptions).

One potential problem facing this payment strategy is an insufficient choice of personnel in certain areas. For example, in rural areas family and general practitioners may serve as assistants more often because other types of personnel, both surgeons and physician assistants, may not be available. In these instances, hospitals may be unable to negotiate a payment level and may have to accept whatever the physician charges. Unfortunately, information on the supply of

nonphysician supply is very limited and precludes assessing this problem beforehand.

Monitoring the effects of this payment methodology, if implemented, should attempt to evaluate reductions in the quality of care, increases in the burden or costs of administration, and the financial impact on hospitals, physicians, physician assistants, and nurse first assistants.

Evaluating changes in the quality of care is always problematic because definitive studies require evaluation of medical records before and after implementation of new system. Results may come well after the system has become a standard or may be irrelevant if the system has already failed. Another approach would be to monitor complaints or survey physicians about their perceptions about any changes in the quality of care and reasons for these changes.

By adding a new code to the uniform bill that describes who served as an assistant-at-surgery would provide a way to measure shifts in the personnel used as the assistant. Hopefully, such a code could be implemented before implementation of the new payment system, so that before and after comparisons could be made.

Also, shifts of surgeries to other settings should also be monitored. Since this system only applies to inpatient surgeries, this strategy might lead to more surgeries provided in outpatient settings. This might occur if the hospital's choice of an assistant conflicted with the surgeon. The surgeon might then prefer, for example, to have another surgeon as an assistant in an outpatient setting than use hospital staff in an inpatient setting. This may not reflect inappropriate care per se, so any ill effects from a shift would have to be determined.

Finally, it should be noted that changing to paying for assistants-at-surgery within the DRG would require changes in legislation. Currently, there are prohibitions against providing the physicians' payment to a facility unless a contractual agreement exists between the facility and the physician. So, adopting this payment methodology would require additional legislation providing for an exception in the case of payments for assistants-at-surgery. The potential success for passing such legislation may then depend on its acceptance to the medical community.

6. DISCUSSION

Various new payment policies for assistants-at-surgery have been considered over the years. These range from incremental reductions in payment to denying all payment for assistants-at-surgery. One alternative would reduce the surgeon's payment by the amount paid to an assistant-at-surgery. This assumes that the surgical payment currently captures the work of an assistant-at-surgery and that, therefore, billings by an assistant are duplicative, and the surgeon is overpaid when assisted. Unfortunately, the appropriateness of and the relative work of assistants-at-surgery depends on the procedure and regional practices. Determining an accurate payment for the surgeon and an assistant remains elusive. In addition, each of these alternatives has political underpinnings so that each of these suggestions is met with a storm of protest. Primary surgeons want to maintain autonomy in choosing the appropriate personnel for the surgery and do not wish this decision to be compromised by financial repercussions. Meanwhile, nurse first assistants face restrictions on practice depending on state laws and cannot receive a separate Part B payment from Medicare. Hence, representatives for nurse first assistants note that physicians prefer to employ physician assistants because of the additional payment Medicare provides.

So there remain two problems that face policymakers. First, they need to identify a feasible payment method that provides incentives for efficient substitution of labor and high quality of care. Second, the implementation of the new policy must involve physicians so that their sense of autonomy is not compromised. For example, if physicians do not trust that a fair negotiation with hospitals is possible, the new policy should provide some mechanism that protects the medical decision making of the primary surgeon.

The next steps forward in improving the payment methodology involve developing a better understanding of who serves as an assistant-at-surgery and under what circumstances. While analyses of claims have

highlighted much of the variability in billing, information provided in claims fail to provide much insight into the underlying mechanisms.

Much could be gained by further exploration of the variation in billings for assistants-at-surgery. Only by truly understanding the underlying mechanisms of when an assistant serves, and who provides the service, can policymakers finally devise a payment policy that is rational and fair.

One possibility for improving our understanding could come from case studies based on a sample of hospitals and their operating rooms. Using physician and hospital claims one can identify hospitals with low, medium, and high rates of billing by physicians as assistants-at-surgery. Case studies and examination of operating room records could establish who actually serves as the assistant and the financial arrangements adopted to pay the assistant. This study would also provide a direct method for assessing the feasibility and merit of incorporating the payment for the assistant-at-surgery into the DRG payment. Also, as part of this study, medical staff could be queried to determine their views of any potential problems or conflicts.

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